DOCUMENT RESUME

ED 349 271 SP 033 945

AUTHOR Denton, Jon; And Others
TITLE Evaluating a Content-Focused Model of Teacher Preparation Via: Classroom Observations, Student Perceptions and Student Performance.
PUB DATE Apr 92
NOTE 27p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, April 20-24, 1992).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; College School Cooperation; Decision Making; Graduate Study; Higher Education; *Knowledge Level; Mathematics Teachers; Preservice Teacher Education; *Program Effectiveness; Science Teachers; Secondary Education; Student Evaluation of Teacher Performance; *Student Teacher Evaluation; *Teacher Effectiveness
IDENTIFIERS *Teacher Knowledge; Texas

ABSTRACT

A university and participating school districts cooperatively developed a 15-month graduate program to certify secondary mathematics and science teachers. A study of the program's instructional model examined three areas: whether knowledge of instructional variables related to occurrence of the variables during classroom instruction by teaching candidates; whether occurrence of instructional variables remained stable over the year; and whether teaching performance data from supervisors and students of the candidates related to achievement on curriculum referenced tests. The model of instruction emphasized the selection and ordering of content to be taught, describing instruction as a series of recurring processes requiring six decision skills. Study data came from videotapes of class sessions, grading records, and four instruments: the Student Perceptions of Teaching Effectiveness; the Observation Record Evaluation Record-Texas Teacher Appraisal System; the Classroom Observation System; and a Physical Science Test (for students of the interns). Teacher candidates demonstrating the greatest knowledge performed less well for maximizing time for instruction, managing student behavior, and maintaining a supportive classroom environment than candidates demonstrating less knowledge. Instructional skills that were directly addressed in a methods and theory course correlated with candidate pedagogical knowledge over the year. Teaching skill ratings of the candidates by supervisors and students were linked to student achievement values. (SM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Evaluating a Content-Focused Model of Teacher Preparation Via: Classroom Observations, Student Perceptions and Student Performance

ED349271

by

Jon Denton

Leena Furtado

Yiqiang Wu

Sharon Shields

Texas A&M University

Prepared for the

American Educational Research Association

Annual Meeting, San Francisco, California

April 23-27, 1992

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. Denton

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

SP033 945

BEST COPY AVAILABLE

Nearly two decades ago, Gage (1972) encouraged research on teacher education to be thought of in terms of the teacher's behaviors and characteristics as dependent variables and ways of recruiting, selecting and educating teachers as independent variables. Expanding on the theme of teacher education research, Peck and Tucker (1973) noted the following characteristics which research literature should exhibit: (a) a "systems" approach to teacher education, (b) direct involvement in the role to be learned (c) the use of pupil-gain measures as the ultimate criteria of the effectiveness of any given process of teacher education. Unfortunately nearly two decades later, research on teaching and research on teacher education is still perceived to suffer from a lack of rigor (Lanier & Little, 1986). Medley (1987) reinforces this assessment with the following description of research on teaching:

> The current state of the scientific base for the practice of teaching...does not exist. Current practice of teaching is based on personal experiences rather than rigorous research. A large proportion of school children learn spontaneously, regardless of how they are taught, but the teacher attributes these outcomes to the method of instruction used (p. 112).

Operating under the assumption that successful teaching requires a repertoire of specialized techniques and theoretical knowledge, then individuals acting as teachers must exercise sound professional judgment in determining what techniques to apply under different circumstances (Shavelson & Stern, 1981). Given this conviction, teachers must internalize an extensive body of pedagogical knowledge and skills to use in different contexts. While pedagogical knowledge may have theoretical, experiential and/or empirical origins, the emphasis of this effort was empirical knowledge. Specifically the focus of this

inquiry was the empirical testing of an instructional model for a teacher preparation program designed to prepare secondary level mathematics and science teachers. Research questions framed to guide this inquiry were:

1. Does knowledge of instructional variables relate to occurrence of those variables during classroom instruction by teaching candidates?

2. Does the occurrence of instructional variables (i.e., events of instruction) remain stable across the year long teaching experience?

3. Are teaching performance data obtained from supervisors and students of the teaching candidates related to student achievement on curriculum referenced tests?

Background

Nearly six years ago, the university and participating school districts developed a 15 month graduate program for certifying secondary school teachers in mathematics and science. This curriculum emphasized a laboratory approach to teacher education designed to apply principles of pedagogy to resolve practical problems in the classroom. Further, the program was structured to accommodate the legal requirements for certification required by the state. It also permitted participants to complete a Masters Degree in Education.

Participating school districts played substantial and significant roles in this program. To illustrate, candidates were selected through joint screening procedures of the host school districts and the university. Second, during a full

academic year, candidates were responsible for teaching four classes each day and were supervised by school district supervisors and university personnel. Third, candidates were employed by the host school district for a period of one academic year. Fourth, assuming all requirements for certification were met successfully, the host district recommended the candidate for teacher certification.

Content Structure of Program: Teacher-education content for this program was drawn from empirical evidence, experience and theory. Empirical evidence, primarily from the process-product research paradigm on teaching, supports an array of concepts, principles and processes that foster effective instructional practices. For example, lists of effective teaching practices have been offered by Good (1979), Brophy (1983) and Rosenshine and Stevens (1986). These teaching practices are very similar to the sequence of instructional moves, "events of instruction," introduced by Gagne (1970, 1977). These instructional moves (i.e., gaining attention of learner, providing objectives to learners, reviewing prerequisites, providing stimulus material with guidance, requiring learner performance of new learnings, providing feedback, assessing learning based on multiple performances and providing multiple examples and applications for retention and transfer) have been verified by process-product research as well as research from instructional psychology (Gagne, 1970, 1977; Glaser, 1976; Klausmeier & Allen, 1978).

Using experience as the basis for selecting content for teacher preparation is well documented. Early normal schools relied extensively on the knowledge and judgement of teachers who shared their craft with teaching apprentices under their tutelage. Certainly, the collective experiences of teacher educators have influenced the scope of pedagogical topics as well as the substantial

emphasis placed on field experiences in the preparation of teachers. Issues associated with classroom decision-making, instructional planning, and reflective teaching emphasize the role of experience as a curricular variable in the preparation of teachers.

Concepts from psychology, sociology, anthropology and philosophy represent theoretical sources of content for teacher preparation. Some examples from sociology will illustrate some important teacher-education content that is drawn from the social science disciplines. The discipline of sociology is a rich source of information about how individuals behave in groups, particularly in various kinds of social settings. Principles related to the role of the teacher, how teachers are influenced by their peer groups in the work place, the influence of administrative styles on teachers, and the impact of the community on the professional life of the teacher reflect professional issues addressed by this discipline.

Three guidelines were followed in selecting content for the teacher-education program. To be considered, the concept, principle, or process had to be: (a) related to student growth as revealed by empirical evidence; or (b) identified as a necessary teacher preparation curricular component by expert opinion based on experience; or, (c) logically explained by theory from social science and/or philosophy (Denton, 1987). Efforts to apply these curricular scope decision rules resulted in the content structure for the preparation program for secondary teachers illustrated in figure 1. Greater elaboration of the program's content structure containing tertiary level subordinate concepts is provided elsewhere (Denton & Peters, 1989).

place Figure 1 about here

Instructional Model of Program: Content elements for the program were subsequently transformed into observable behaviors. Then instructional strategies were developed to enable candidates to demonstrate the desired knowledges and skills. Sequencing of the instructional strategies was guided by the content-focused instructional model (figure 2) developed for this program.

place Figure 2 about here

This model of instruction described instruction as a series of recurring processes requiring six distinct decision skills. Further, the model was based on the assumption that secondary teachers teach an academic rationalist curriculum (Vallance, 1985). As the name suggests, this orientation placed substantial emphasis on the selection and ordering of content to be taught. Under this model, candidates were asked to begin instructional planning by mapping relations of key content elements and then conducting concept analyses of those elements. Concept analysis involved defining selected concepts in terms of their critical and variable characteristics followed by the selection of example/non-example pairs that emphasized the critical characteristics of the concept. Next, illustrative principles involving the concept were noted, and applications such as problems or exercises involving the concept were developed (Klausmeier & Allen, 1978). This decision skill enabled the candidate to develop substantial information about key concepts. Candidates following these steps became thoroughly familiar with the formal-knowledge characteristics of the concepts they planned to teach.

The second decision skill in the model required candidates to translate formal knowledge elements into behavioral referents to be exhibited by their learners. Candidates considered what behavior or behaviors had to be exhibited by their learners to demonstrate mastery of the designed outcome as well as how to measure those performances. In addition, they made preliminary decisions

about the level of cognitive processing (knowing, understanding, applying, analyzing) they expected learners to exhibit. At this point in the process, candidates were encouraged to think of their outcomes as tentative, since changes might be necessary as subsequent instructional decisions were considered.

Next, candidates developed instructional strategies. These strategies placed substantial emphasis on learner guidance, learner performance, and feedback. For this decision skill, candidates considered information they had compiled on key concepts through concept analysis and the nature of the desired learning outcomes as they selected instructional activities. Once instructional activities were selected, they were sequenced into instructional strategies that incorporated Gagne's (1977) "events of instruction." Activities were sequenced to assure that the following instructional events occurred: (a) attention of learner is obtained and maintained, (b) objective is communicated to learner, (c) prerequisite information is reviewed, (d) new information is presented with cuing and guidance offered as needed, (e) opportunities for learner performance are provided followed by feedback on the appropriateness of the performance, (f) assessment by the teacher is made regarding whether additional information as well as additional performance-feedback cycles are necessary for learners to master the related outcome. The complexity of instructional strategies (as evidenced by the number of instructional activities and the allocated time for students to master targeted outcomes) depended on the desired level of learner cognitive functioning for each learning outcome. As a rule, candidates organized a greater number of instructional activities into an instructional strategy as its expected level of cognitive functioning advanced (Denton, Armstrong & Savage, 1980).

The model then encouraged the candidate to accommodate the entry level skills of individual learners by adjusting the planned instructional strategies if prerequisites were not evident. If learners did not have a firm grasp of concepts of principles that were considered to be necessary prior knowledges for the intended learning outcome, the instructional strategy was modified. This modification enabled learners to begin at a point more consistent with their existing levels of understanding.

During the implementation of instructional strategies, if learners failed to demonstrate satisfactory progress, the candidate adjusted the strategy and attempted another approach. In this model, evaluating instruction was considered to be a formative and iterative process. Candidates were encouraged to use criterion-referenced tests and assessment procedures. Data were gathered that allowed candidates to assess not only students' progress but the effectiveness of the instructional system as well.

Methods

Sample: Since this program was established as a post-baccalaureate program to certify secondary school teachers in mathematics and science, common characteristics across the candidates included baccalaureate degrees with an area or emphasis in one of the sciences and/or mathematics. Cohort 1 (1986-87) contained 6 candidates. Cohort II (1987-88) began with 7 candidates, but six completed the program, Cohort III (1988-89) had 11 candidates and Cohort IV 1989-90) contained 7 candidates. The analyses of this investigation employed data from 10 to 22 candidats and their students. One reason for the reduced number of candidates in the sample was that different end-of-year tests were administered to students of the candidates. Ten candidates who had administered physical science tests were included in this investigation because this test was

administered more frequently than the examinations in mathematics, earth science, and biology. Further, five candidates failed to administer the end-of-year examinations to their students requiring their exclusion from the sample analysis.

Instruments: Four instruments and grading records for the course, *Methods and Theory of Teaching* were used to provide data for this investigation. Three of these instruments were designed to obtain information on classroom performances of the teaching candidate, while the fourth was an end of course curriculum-referenced examination administered to students of the teaching candidates. Brief descriptions of each instrument follows.

The *Student Perceptions of Teaching Effectiveness* (SPTE) instrument was developed to assess performances of teaching interns. The SPTE incorporates the behavioral indicators of the initial four domains of the Observation Record/Evaluation Record-Texas Teacher Appraisal System [OR/ER] (Texas Education Agency, 1986). Statements describing teaching behaviors were phrased to take into account: the student's viewpoint in the classroom; whether the vocabulary was appropriate for junior-senior high school students; and readability. The first version of the instrument contained 46 items which was reduced to 26 items clustering in two factors through a validation process involving factor analysis (West, 1990). Similar analyses were conducted with independent sets of SPTE data from 510 and 773 students, respectively. The latter analyses yielded both two and three factor models, although 23 of the 26 items of the SBTE loaded either exclusively or most heavily on the same factors from both analyses. Figure 3 presents a total listing of the items on the instrument. Students responded to these items on a five interval scale ranging from strongly agree to strongly disagree.

place Figure 3 about here

The *Observation Record/Evaluation Record-Texas Teacher Appraisal System* (OR/ER), a component of the state teacher appraisal system, (Texas Education Agency, 1986) is organized around five domains (i.e., Instructional Strategies, Classroom Management and Organization, Learning Environment, Presentation of Subject Matter and Professional Growth and Responsibilities). Application of the instrument requires certified observers to judge whether the 65 performance indicators clustered under the five domains are evidenced during a teaching episode. Further, all teacher appraisers are required to attain a stated level of coding proficiency (.70 agreement index) before they are certified by the Texas Education Agency to use the instrument. Figure 4 presents the behavioral indicators for the first domain, Instructional Strategies.

place Figure 4 about here

The Classroom Observation System (COS): Three lessons for each candidate were video taped during the course of their nine month teaching experience. These taped lessons were subsequently analyzed with the Classroom Observation System. This instrument was developed to record observed actions and decisions made by a teacher during a lesson regarding classroom management, events-of-instruction, and instructional media. The theoretical framework of the instrument was based on the literature of Kounin (1970), Gagne and Briggs (1974), and research on teacher effectiveness. While the instrument could be used in a variety of settings, it was designed for large group (whole class) instruction that was directed and controlled by the teacher. The reliability and validity of the instrument has been found to be quite stable (e.g., Interobserver agreement for events-of-instruction ranged from .75 to .87, intracoder agreement ranged from

.77 to .90 across three trained observers) (Tsai, 1990) Figure 5 presents the coding sheet for this system.

place Figure 5 about here

A *Physical Science Test (Curriculum Reference Test)* containing 40 items was administered to students of the interns at the conclusion of the school year. Based on the administration of the instrument to nearly 500 students, an estimate of internal consistency (Cronbach's Alpha) was determined to be .88. An item analysis of the test produced an average discrimination index of .52 and a mean difficulty index of 58. Each of the following topics represented on the test was cross referenced to the Essential Elements of physical science listed in the State of Texas Curriculum for Public Schools, 19 TAC Chapter 75 Curriculum: Laboratory Safety (3 items), Laboratory Apparatus (3 items), Physics Concepts (13 items), Properties of Matter (7 items), Chemical Concepts (9 items) Graph Interpretation (5 items).

Course performance of each candidate for the course, *Methods and Theory of Teaching* also provided data for this investigation. The number of objectives attained in this course was the value recorded to depict the candidate's knowledge of instructional variables and decision skills related to these variables. (See data collection for explanation of how this value was determined.) This course directly presented and emphasized the **content focused instructional model** to the candidates and required the candidates to integrate their knowledge of instructional decision skills into curriculum units, although the candidates were not required to implement their units in actual classrooms during the course.

Data Collection

For this teacher preparation program, criterion referenced course tests for *Methods and Theory of Teaching* were referenced directly to the intended learning outcomes and were used to determine whether intended outcomes had become actual outcomes. These criterion referenced tests ranged in cognitive level from knowledge through analysis and synthesis. Feedback was provided and remediation and retesting occurred when candidates failed to reach criterion for a particular outcome. However, retesting was only available for the introductory knowledge level outcomes because extensive performance-feedback loops (multiple performances) were encouraged when higher order cognitive outcomes were expected. Performance data drawn from course grade files served to document the candidate's progress in acquiring the underlying content structure of pedagogy on which the course was based and became the values to represent the candidate's knowledge base as they began their teaching experience. These data were used in the analysis associated with research question 1.

Two classroom observation systems were applied as the candidates moved into their classroom experience. First, four formal appraisals were conducted by school administrators and evaluators with the state's official observation system, the Texas Teacher Appraisal System-OR/ER (Texas Education Agency, 1986). Two appraisals were conducted by each of the candidate's two teacher evaluators, one occurring in the fall (formative) and the second during the spring (summative). These official appraisals provided data to indicate whether the candidate was successfully exhibiting teaching skills associated with the teaching effectiveness literature (Good & Brophy, 1991). Frequent informal TTAS appraisals or formative assessments were conducted by the university supervisor and mentor teacher especially during the fall semester to prepare the candidate for the formal appraisals. In addition, video recordings of three entire class

sessions (fall, winter and spring) taught by each candidate were made and subsequently coded by applying the Classroom Observation System (Denton, Clark, Rossing & O'Connor, 1984-85; Tsai, 1990). Here attention was directed to what "event of instruction" (Gagne, 1977; Gagne & Briggs, 1974), classroom management variable (Kounin, 1970) and technological support (e.g., chalkboard, print material, microcomputer) were being applied. Classroom observation data were used in the analyses associated with research questions 1 and 2.

Near the conclusion of the year long classroom experience, the teaching candidates administered a curriculum referenced test and a questionnaire to obtain end-of-year performance and perceptional data from their students. For this investigation, the physical science test was administered as the curriculum based test and the SPTE provided student perceptions regarding the candidate's classroom skills. These data were used in conjunction with the analyses associated with research question three. Data obtained from the OR/ER and SPTE were clustered into categories presented in figure 6 for analyses associated with research questions 1 and 3.

place Figure 6 about here

Findings

For the first research question, candidate performance in the course, *Methods and Theory of Teaching* was based on the total number of objectives attained, this value was recorded as the indicator of the candidate's knowledge of pedagogical principles and concepts immediately prior to the yearlong classroom teaching experience. As noted previously, candidates were provided with extensive feedback and allowed opportunities to attempt criterion level performances after receiving feedback on initial performances. It is quite likely this instructional condition restricted the range of values across the candidates,

since values of 17 to 22 occurred. These values represented grades from C to A, with the average value being 20. While this frequency is a straightforward value, the integrity of measurement associated with each objective was not treated in a psychometric sense, thus the potential for error of measurement was great.

Correlation coefficients were determined between the course performance values and combined domain OR/ER ratings of the school's teacher appraisers collected during the spring semester of the classroom teaching experience. Table 1 presents the results of that analysis.

place Table 1 about here

The modest correlation values for 6 of the 9 associations may be due to the suspect psychometric underpinning of the candidate pedagogical knowledge values, yet the three values which were statistically significant indicate an inverse relation between the candidate's pedagogical knowledge and subsequent performance in the classroom. This was an unanticipated finding and will be discussed in the final section of this paper.

Analyses associated with research question two, involved determining correlations linking candidate pedagogical knowledge and subsequent instructional skill occurrence of the candidates measured by applying the *Classroom Observation System* to video recorded classes obtained across the school year. Correlations did vary across fall, winter and spring observations. The following correlations were observed: **stating objectives** (r's = -.14, .15, .32) **stimulus presentation** (r's = .16, -.18, .29) **cuing** (r's = -.18, .04, .22) **learner performance** (r's = .31, -.16, .27) and **feedback** (r's = -.23, .06, .19) revealing the relations across the school year. With the exception of the relation between pedagogical knowledge and occurrence of the desired instructional skill, learner performance, the trend of values across the observations indicate the desired

teaching skill correlated more positively with course performance related to that skill as the year proceeded.

For the final research question, assessments of the candidate's teaching skills obtained from administering the OR/ER system by school appraisers during the spring semester and administering the SPTE instrument to students of the candidates near the end of the spring term were correlated to end-of-year student performances on a curriculum referenced physical science test. Data from students of ten candidates were used in these analyses. Table 2 summarizes the findings.

place Table 2 about here

All of the statistically significant values in this table occurred for the pedagogical skills that can be grouped under classroom management and organization. In contrast to the values registered for the first research question, these correlations were largely positive across the comparisons.

Discussion

As noted in the findings, the negative correlations between indicators of pedagogical knowledge and pedagogical skill ratings by trained teacher appraisers was unexpected. Although the error of measurement associated with the pedagogical knowledge indicator potentially affected the results, the idea is disturbing that candidates demonstrating the greatest knowledge consistently performed less well for maximizing time for instruction, managing student behavior and maintaining a supportive environment in classrooms than candidates who exhibited a lower level of proficiency regarding pedagogical knowledge. One explanation for these unexpected findings is that the course, *Methods and Theory of Teaching* that was used as the source for the pedagogical knowledge indicator **did not address these skills.** Rather, a companion course

taken before classroom teaching began addressed classroom management and organization. Unfortunately, candidate performance from this course was not available for this investigation.

Findings associated with research question two, regarding the stability of instructional variables across the year of teaching experience carried the relation of pedagogical knowledge with pedagogical skills an additional step. Here, **instructional skills that were directly addressed in the course**, *Methods and Theory of Teaching* were correlated with candidate pedagogical knowledge across the yearlong experience. While inverse relations occurred across all of the instructional skills, by the spring or final observation all relations were positive, although not statistically significant. These values raise questions about the amount of directed practice necessary to link teaching candidates' pedagogical knowledge base with their pedagogical behavior in the classroom.

In the final set of analyses, teaching skill ratings of the candidates by their supervisors and their students were linked to student achievement values on end-of-year curriculum referenced tests. The only skills relating to student achievement that reached statistical significance were under classroom management and organization. Apparently these particular skills have indicators that are evident to both supervisors and students. Yet not many of the pedagogical skills that historically have been linked to process-product research (Good & Brophy, 1991; Rosenshine & Stevens, 1986) yielded statistically significant correlations in this investigation. Certainly one contextual variable that was different in this investigation from process-product research was the experience level of the teacher. This characteristic alone could result in a changing pattern of instructional skills across the initial year of teaching experience and thus affect the ratings of both supervisors and students.

An attempt was made in this investigation to link components of a teacher preparation model through course work performance, classroom observations and student achievement. While the relations have not been large, the significant relations linking classroom management to student achievement supports the idea that teaching candidates worry most about managing their classes during their early days of teaching. It is possible that this concern occurs because skill levels in classroom management are visible to all. Further, the significant findings associated with the final research question correspond to Medley's (1987) recommendation that research into program elements that are logically and temporally close together are the variables that should be examined to advance the field.

References

Brophy, J. (1983). Classroom organization and management. In D. C. Smith (Ed.), *Essential knowledge for beginning educators*. Washington DC: American Association of Colleges for Teacher Education.

Denton, J. J. (1987). Factors influencing quality in teacher education: Program, faculty, and productivity. *Teacher Education and Practice, 4* , 7-18.

Denton, J. J., Armstrong, D. G., & Savage, T. V. (1980). Matching events of instruction to objectives. *Theory Into Practice, 11,* 10-14.

Denton, J. J., Clark, F. E., Rossing, R. G., & O'Connor, M. J. (1984-85). Assessing instructional strategies and resulting attitudes regarding two-way television instruction. *Journal of Educational Technology Systems, 13* , 281-289.

Denton, J. J., & Peters, W. H. (1989). *Program assessment report-curriculum evaluation of a non-traditional program for certifying teachers*. College Station, TX: Texas A&M University, Instructional Research Laboratory. (ERIC Document Reproduction Service No. ED-300-361)

Gage, N. L. (1972). *Teacher effectiveness and teacher education the search for a scientific basis*. Palo Alto: Pacific Books Publisher.

Gagne, R. M. (1970). *The conditions of learning* (2nd ed.). New York: Holt, Rinehart & Winston.

Gagne, R. M. (1977). *The conditions of learning* (3rd ed.). New York: Holt, Rinehart & Winston.

Gagne, R. M. & Briggs, L. J. (1974). *Principles of instructional design*. New York: Holt, Rinehart & Winston.

Glaser, R. (1976). Components of a psychology of instruction: Toward a science of design. *Review of Educational Research, 46,* 1-24.

Good, T. (1979). Teacher effectiveness in the elementary school: What we know about it now. *Journal of Teacher Education, 30,* 52-64.

Good, T., & Brophy, J. (1991). *Looking in Classrooms* (5th ed.). New York: Harper & Row.

Klausmeier, J. K., & Allen, P. S. (1978). *Cognitive development of children and youth: A longitudinal study.* New York: Academic Press.

Kounin, J. (1970). *Discipline and group management in classrooms.* New York: Holt, Rinehart & Winston.

Lanier, J. E. & Little, J. W. (1986). Research on teacher education. In M. D. Wittrock (Ed.). *Handbook of research on teaching* (3rd ed.) (pp 527-569). New York: Macmillan Publishing Co.

Medley, D. M. (1987). Evolution of research on teaching. In M. J. Dunkin (Ed.). *The international encyclopedia of teaching and teacher education.* (pp 105-113). Elmsford, NY: Pergamon Press.

Peck, R. F. & Tucker, J. A. (1973). Research on teacher education. In R.M.W. Travers (Ed.). *Second handbook of research on teaching.* (pp 940-978). Chicago: Rand McNally & Company.

Rosenshine, B., & Stevens, R. (1986). Teaching functions. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed.), (pp. 376-391). New York: Macmillan.

Shavelson, R. & Stern, P. (1981). Research on teachers' pedagogical thoughts, judgements, decisions and behavior. *Review of Educational Research. 51* 455-498.

Texas Education Agency (1986). Texas Teacher Appraisal Instrument. Austin, Texas.

Tsai, C.Y. (1990). *The reliability of the classroom observation system.* Doctoral dissertation, Texas A&M University, College Station, Texas.

Vallance, E. (1985). Ways of knowing and curricular conceptions: Implications for program planning. In E. Eisner (Ed.), *Learning and teaching the ways of knowing.* Eighty-fourth yearbook of the National Society for the Study of Education, Part II. Chicago, IL: University of Chicago Press.

West, S. S. (1990). *Student Perceptions of Teaching Effectiveness.* Doctoral dissertation, Texas A&M University, College Station, Texas.

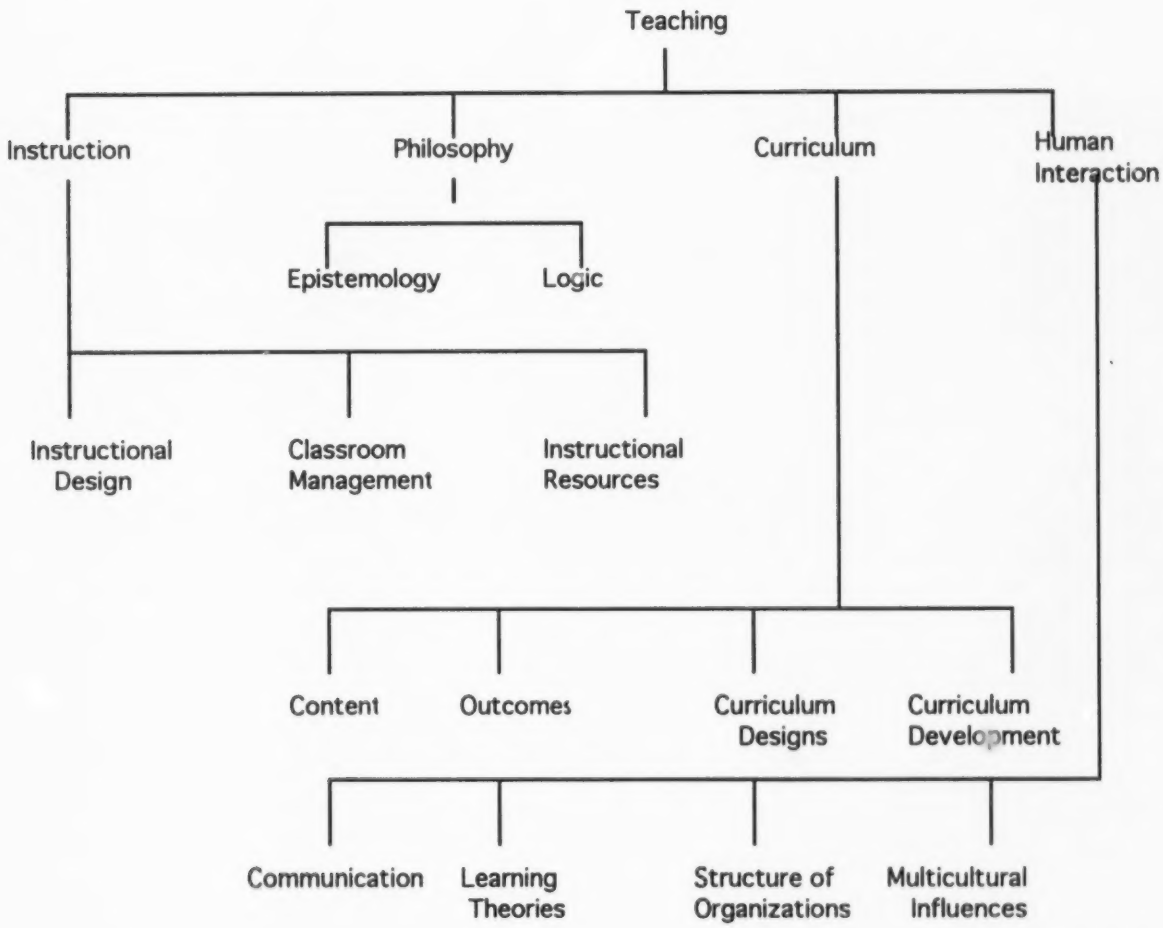

Figure 1

CONTENT MAP FOR SECONDARY LEVEL TEACHER PREPARATION

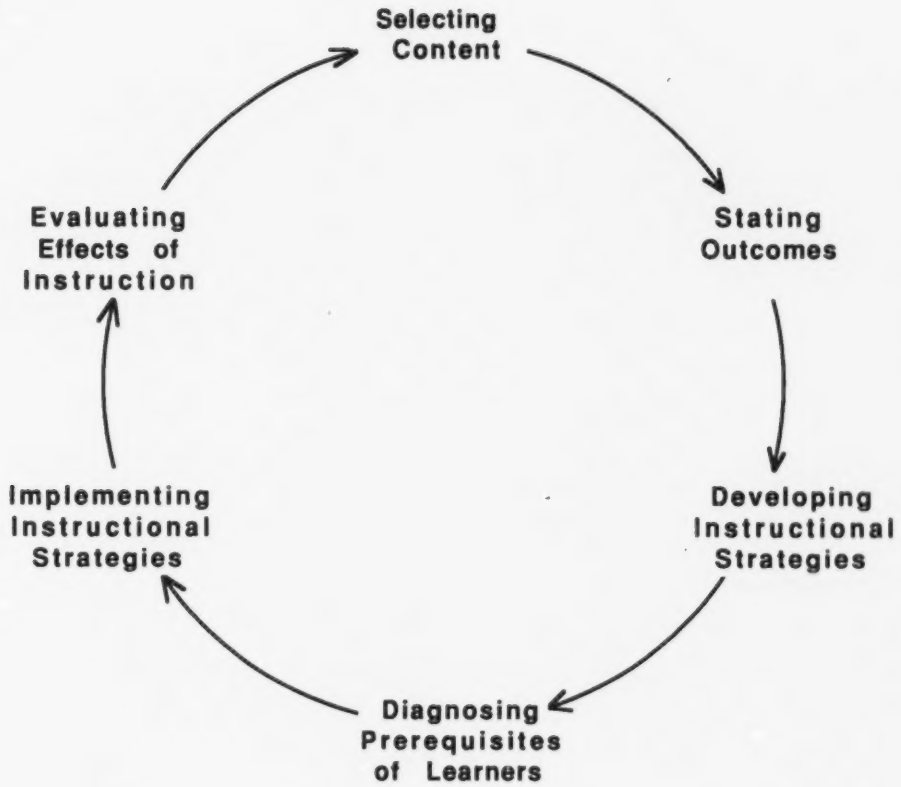

Figure 2

CONTENT FOCUSED INSTRUCTIONAL MODEL FOR PREPARING SECONDARY TEACHERS

1. The teacher instructs using more than one approach, that is, large group, small group and to individuals.
2. The teacher encourages and calls on non-volunteers to participate in class.
3. The teacher instructs the class at an appropriate level, not too difficult and not too easy.
4. The teacher communicates to students what they are to learn as a result of the lesson.
5. The teacher reteaches a topic a different way if the class does not understand.
6. The teacher distributes and collects class materials efficiently not wasting class time.
7. The teacher has materials, equipment, and the laboratory ready when class begins.
8. The teacher avoids wasting time at the end of the period.
9. The teacher makes sure that activities occur in a sequence that makes learning easy.
10. The teacher stays on the topic.
11. The teacher explains expectations for class behavior.
12. The teacher identifies students who are doing something other than the assigned task and guides them back to their class work.
13. The teacher offers praise to the class and to individuals when behavior is appropriate.
14. The teacher begins class by directing student attention to the purpose of the activity.
15. The teacher uses clear examples to explain new ideas.
16. The teacher often stresses the principles which relate the terms to one another.
17. The teacher uses words and vocabulary to explain the content in a way that is understandable.
18. The teacher stresses the important points of content in a lesson.
19. The teacher will explain some point again after students indicate they do not understand.
20. The teacher uses correct grammar in speaking and writing.
21. The teacher pronounces words correctly and clearly.
22. The teacher emphasizes the value of the content or lesson to students.
23. The teacher communicates an awareness and appreciation of student effort and progress.
24. The teacher challenges students to succeed at different tasks.
25. The teacher praises students for specific performances.
26. The teacher asks questions in class and on tests which make me think.

Figure 3
Items for the Instrument
Student Perceptions of Teaching Effectiveness

I. Instructional Strategies

1. Provides opportunities for students to participate actively and successfully.
   a. varies activities appropriately
   b. interacts
   c. solicits student participation
   d. extends responses/contributions
   e. provides time for response/consideration
   f. implements at appropriate level

2. Evaluates and provides feedback on student progress during instruction.
   a. communicates learning expectations
   b. monitors student performance
   c. solicits responses/demonstrations for assessment
   d. reinforces correct response/performances
   e. provides corrective feedback/clarifies/none needed
   f. reteaches/none needed

Figure 4
Behavioral Indicators for Domain I. Instructional Strategies
of
Observation Record/Evaluation Record

Teacher: _____
Date: _____
Class Period: _____
Class Time: _____

I. Classroom Management
1. withitness
2. overlapping
3. transitions
4. smoothness and momentum
5. alerting
6. accountability
7. not appropriate

II. Events of Instruction
1. gaining attention
2. informing learner objective
3. stimulating recall of prerequisites
4. presenting new information
5. providing learner guidance
6. eliciting performance
7. providing feedback
8. assessing performance
9. enhancing retention & transfer
0. non-event

III. Media Support
A. chalkboard
B. transparency
C. slides
D. film
E. video tape
F. audio tape
G. microcomputer
H. chart
I. text
J. model
K. other
L. not applying media

Ovserver: _____
Date: _____

Time	I	II	III	Comments
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				

Figure 5
COS Coding Sheet

Pedagogical Skill Categories	OR/ER Items	OR/ER Scores	SPTE Items	SPTE Scores
1. Provides opportunities for students to participate actively and successfully	A	1	1	5
	D	1	2	5
	F	1	3	5
	EQ	3		
	TOT	6	TOT	15
2. Evaluates and provides feedback on student progress during instruction	A	1	4	5
	F	1	5	5
	EQ	3		
	TOT	5	TOT	10
3. Organizes materials and students	B	1	6	5
	E	1	7	5
	EQ	3		
	TOT	5	TOT	10
4. Maximizes amount of time available available for instruction	A	1	8	5
	B	1	9	5
	D	1	10	5
	EQ	3		
	TOT	6	TOT	15
5. Manages student behavior	A	1	11	5
	C	1	12	5
	E	1	13	5
	EQ	3		
	TOT	6	TOT	15
6. Teaches for transfer	A	1	14	5
	D	1	15	5
	E	1	16	5
	F	1	19	5
	EQ	3		
	TOT	7	TOT	20
7. Uses effective communication skills	B	1	17	5
	C	1	18	5
	D	1	20	5
	E	1	21	5
	EQ	3		
	TOT	7	TOT	20
8. Uses strategies to motivate students for learning	B	1	22	5
	C	1	23	5
	D	1	24/26*	5
	EQ	3		
	TOT	6	TOT	15
9. Maintains supportive environment	C	1	25	5
	EQ	3		
	TOT	4	TOT	5

Figure 6

Items of OR/ER and SPTE Clustered Under Each Pedagogical Skill

Table 1: Correlation coefficients relating candidate pedagogical knowledge with appraiser ratings of pedagogical skills

OR/ER Pedagogical Skill	r	alpha
Provides opportunities for active participation	.10	-
Provides feedback regarding performance	-.27	-
Organizes materials and students	-.46	-
Maximizes time for instruction	-.72	.01
Manages student behavior	-.64	.05
Teaches for transfer	-.30	-
Uses effective communication skills	-.11	-
Motivates students for learning	-.24	-
Maintains supportive environment	-.62	.05

Table 2: Correlation coefficients relating appraiser ratings and student perceptions of a candidate's pedagogical skills with student achievement in physical science

	OR/ER-ACH		SPTE-ACH	
OR/ER & SPTE Pedagogical Skill	r	alpha	r	alpha
Provides opportunities for active participation	-.04	-	-.12	-
Provides feedback regarding performance	.28	-	.12	-
Organizes materials and students	.48	.08	.70	.01
Maximizes time for instruction	.33	-	.46	.09
Manages student behavior	.62	.03	.09	-
Teaches for transfer	-.20	-	.27	-
Uses effective communication skills	.21	-	-.13	-
Motivates students for learning	.13	-	.07	-
Maintains supportive environment	.22	-	.06	-